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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/720,938	05.02/2001	Manfred Rothley	10191/1694	8316

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EXAMINER

HANNAHER, CONSTANTINE

ART UNIT PAPER NUMBER

2878

DATE MAILED: 12/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/720,938

Applicant(s)

ROTHLEY ET AL.

Examiner

Constantine Hannaher

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6. 6) ☐ Other: _____

DETAILED ACTION

National Stage Application

1. The Examiner acknowledges consideration of the International Preliminary Examination Report in International Application PCT/DE99/01869. MPEP § 1893.03(e).

Information Disclosure Statement

2. The references cited in the Search Report May 20, 2001 have been considered, but will not be listed on any patent resulting from this application because they were not provided on a separate list in compliance with 37 CFR 1.98(a)(1). In order to have the references printed on such resulting patent, a separate listing, preferably on a PTO-1449 form, must be filed within the set period for reply to this Office action.

3. As set forth in MPEP § 609:

37 CFR 1.98(b) requires that each item of information in an IDS be identified properly. U.S. patents must be identified by the inventor, patent number, and issue date. U.S. patent application publications must be identified by the applicant, patent application publication number, and publication date. U.S. applications must be identified by the inventor, the eight digit application number (the two digit series code and the six digit serial number), and the filing date. If a U.S. application being listed in an IDS has been issued as a patent, the applicant should list the patent in the IDS instead of the application. Each foreign patent or published foreign patent application must be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application. Each publication must be identified by publisher, author (if any), title, relevant pages of the publication, date and place of publication. The date of publication supplied must include at least the month and year of publication, except that the year of publication (without the month) will be accepted if the applicant points out in the information disclosure statement that the year of publication is sufficiently earlier than the effective U.S. filing date and any foreign priority date so that the particular month of publication is not in issue. The place of publication refers to the name of the journal, magazine, or other publication in which the information being submitted was published.

No date of publication whatsoever has been identified for the listed publication.

Oath/Declaration

4. When applicant states that the post office address is the "same" as residence applicant's representative should keep in mind that a "residence" is a city and state or foreign country. The superfluous information given for residence is accepted as constituting a mailing address. The Office has been able to discern the city and state or foreign country of residence from the information supplied. See the requirements of 37 CFR 1.63(c)(1) as amended effective November 7, 2000.

Claim Objections

5. Claim 24 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Independent claim 19 recites a combination with three elements. Dependent claim 24, by permitting one element to form another element in the combination, reduces the combination to two elements and thus does not include every limitation of the parent claim.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 19-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to independent claim 19 and dependent claims 20-35, process limitations cannot serve to impart patentability to structures. *In re Dike*, 157 USPQ 581, 585 (CCPA 1968). Methods of making a claimed product are immaterial in a product claim in view of *In re Thorpe*, 777

F.2d 695, 227 USPQ 964 (Fed. Cir. 1985) and *In re Brown*, 459 F.2d 531, 173 USPQ 685 (CCPA 1972). It is axiomatic that the additional presence of process limitations, no matter how detailed, cannot impart patentability to a product. *In re Pilkington*, 411 F.2d 1345, 162 USPQ 145 (CCPA 1969); *In re Johnson*, 394 F.2d 591, 157 USPQ 620 (CCPA 1968); and *In re Stephen*, 345 F.2d 1020, 145 USPQ 656 (CCPA 1965). Accordingly, the recitation of a "micromechanically producible" image-producing optical imaging system fails to establish any limitation on the optical imaging system on that basis. Since an apparatus for sensing electromagnetic radiation comprising a detector structure **39**, a protective window, and an optical imaging system **37** is anticipated or made obvious by Fig. **12** of EP-0809304-A2, the recitation of "micromechanically producible" must be intended to distinguish over the prior art but is incapable of doing so. The scope of the claims is indefinite.

With respect to independent claim 36, the recitation of "micromechanical fashion" fails to establish any limitation on the produced optical imaging system and detector structure as there does not appear to be any difference between a specifically "micromechanical fashion" of production and the routine procedures of manufacture in the art. Since a method for producing an apparatus comprising producing an optical imaging system **37** and a detector structure **39** is made obvious by Fig. **12** of EP-0809304-A2 (with any necessary secondary reference to suggest monolithicity), the recitation of "micromechanical fashion" must be intended to distinguish over the prior art but is incapable of doing so. The scope of the claim is indefinite.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent

by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 19-22, 24-26, 29, and 31 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Ray *et al.* (US005701008A).

With respect to independent claim 19, Ray *et al.* discloses an apparatus (Fig. 4) for sensing electromagnetic radiation comprising a detector structure 6 formed on a semiconductor substrate 2 (column 3, lines 3-4, and improperly identified as 12 in the view), a protective window 10 for the detector structure, and an image-producing optical imaging system 12. The optical imaging system 12 qualifies as micromechanically producible in view of the description at column 4, lines 1-4.

With respect to dependent claim 20, the optical imaging system 12 in the apparatus of Ray *et al.* includes a lens (column 3, line 41) producible by the method set forth in column 4, lines 1-4.

With respect to dependent claim 21, seal 8 with its precisely controlled height (column 3, lines 29-33) in the apparatus of Ray *et al.* rigidly joins the optical imaging system 12 to the detector structure 6.

With respect to dependent claim 22, the detector structure 6 in the apparatus of Ray *et al.* includes multiple separate detector elements and the (optical) imaging system 12 includes multiple lenses. Each lens of the multiple lenses is associated with a respective one of the detector elements (column 3, lines 64-66).

With respect to dependent claim 24, the optical imaging system 12 in the apparatus of Ray *et al.* forms (some portion) of the protective window 10.

With respect to dependent claim 25, the vacuum-sealed Dewar assembly described by Ray *et al.* constitutes a protective housing. Optical imaging system 12 is set into the protective housing (Fig. 1).

With respect to dependent claim 26, the apparatus of Ray *et al.* further comprises spacers **8** provided between the substrate **2** of the detector structure **6** and the optical imaging system **12**.

With respect to dependent claim 29, the optical imaging system **12** in the apparatus of Ray *et al.* is constructed on a semiconductor substrate (column 3, lines 50-57).

With respect to dependent claim 31, at least one of the optical imaging system **12** and the substrate **2** of the detector structure **6** is made at least partially of silicon (column 3, line 4).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 23, 30, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ray *et al.* (US005701008A).

With respect to independent claim 23, although Ray *et al.* associates a lens **12** with each detector element **6**, the provision of one of a plurality of lenses for a group of detector elements

would have been obvious to one of ordinary skill in the art at the time the invention was made in view of such concerns as optical efficiency, desired fields of view, packaging, and the like.

With respect to dependent claim 30, although the optical imaging system **12** and the substrate **2** of the detector structure **6** in the apparatus of Ray *et al.* are made of different materials as described, the use of the same material would have been obvious to one of ordinary skill in the art at the time the invention was made in view of the variety of effective performance and the flexibility in choice afforded by the description at column 3, lines 53-55.

With respect to dependent claim 34, although Ray *et al.* describes silicon microbolometers as the detector structure **6**, the use of thermocouples to detect electromagnetic radiation is known, and it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Ray *et al.* to include thermocouples in view of the desired performance.

13. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ray *et al.* (US005701008A) in view of Amingual *et al.* (US004675525A).

With respect to dependent claim 27, the detector structure **6** in the apparatus of Ray *et al.* includes multiple separate detector elements (Figs. **2** and **4**) but they are not separated from one another by optical partitions. Such partitions are known from the apparatus of Amingual *et al.* (Fig. **3**) comprising detector structure **1** formed on semiconductor substrate **7** (column 4, lines 51-54) and optical partitions **19**. In view of the accurate definition of the detection sensitive surface of the detector elements as suggested by Amingual *et al.*, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Ray *et al.* to comprise optical partitions.

With respect to dependent claim 28, the optical partitions **19** suggested by Amingual *et al.* are coated **31** to decrease transmission (column 5, lines 9-13).

14. Claims 19, 20, 29, 32, 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gramann *et al.* (US005907151A).

With respect to independent claim 19, Gramann *et al.* discloses an apparatus **2** (Fig. **1**) for sensing electromagnetic radiation comprising a detector structure **1** formed on a semiconductor substrate **7** (column 5, line 66), a protective window **27, 29** for the detector structure **1**, and an optical system **21**. The optical system **21** does not necessarily form an image of a subject onto a plane of the detector structure **1**. Nevertheless, imaging with a detector structure **1** of the type disclosed by Gramann *et al.* is known, and it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Gramann *et al.* such that the optical system **21** imaged onto a plane of the detector structure **1** in view of the desirability of a compact, robust imaging apparatus. Since optical system **21** may be formed in the carrier plate **7** (column 8, line 2) the producibility thereof may be fairly described as micromechanical.

With respect to dependent claim 20, the optical system **21** in the apparatus of Gramann *et al.* includes a lens **21** (column 7, line 63) which may be fairly described as micromechanically producible.

With respect to dependent claim 29, the optical system **21** in the apparatus of Gramann *et al.* is constructed on a semiconductor substrate **7**.

With respect to dependent claim 32, the detector structure **1** in the apparatus of Gramann *et al.* is applied on a back side of the substrate **7** of the optical system **21** (see Figs. **1, 3, 6, and 10**).

With respect to dependent claim 35, although as pointed out above process limitations cannot serve to impart patentability to structures, the optical system **21** and the detector structure **1** in the apparatus of Gramann *et al.* are formed by joining two wafers prior to sectioning (Figs. **9A and 9B**).

With respect to independent claim 36, Gramann *et al.* suggests a method for producing the illustrated apparatus (Fig. 6) for sensing electromagnetic radiation which would comprise the step of producing an optical system **21** and a detector structure **1**. The detector structure **1** is for sensing electromagnetic radiation (column 5, line 51), but the optical system **21** does not necessarily form an image of a subject onto a plane of the detector structure **1**. Nevertheless, imaging with a detector structure **1** of the type disclosed by Gramann *et al.* is known, and it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Gramann *et al.* such that the apparatus produced used optical system **21** to image onto a plane of detector structure **1** in view of the desirability of a compact, robust imaging apparatus. Since optical system **21** and detector structure **1** are in, or on, the same carrier plate **7** (see column 8, line 2 for formation of optical system **21** in carrier plate **7**) the production thereof may be fairly described as monolithic and micromechanical.

15. Claims 19, 20, 22, 29, 30, 31, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cox (US005401968A).

With respect to independent claim 19, Cox discloses an apparatus **10** (Fig. 3) for sensing electromagnetic radiation comprising a detector structure **22** to sense electromagnetic radiation and formed on a semiconductor substrate **44** (column 3, line 6) and an image-producing optical imaging system **30** forming an image of a subject **18** onto a plane of the detector structure **22**. Cox does not disclose a protective window, but in view of the schematic illustration of the apparatus (Fig. 1), it would have been obvious to one of ordinary skill in the art at the time the invention was made that a protective window for the detector structure **22** would be within the side of the airplane, for example, or in the housing allowing an operator to hold and manipulate the apparatus and the like.

Optical imaging system **30** in the apparatus of Cox qualifies as micromechanically producible in view of the description at column 3, lines 1-2.

With respect to dependent claim 20, the optical imaging system **30** in the apparatus of Cox includes a lens (column 2, lines 52-55) which is micromechanically producible (column 2, lines 57-60 and column 3, lines 7-20).

With respect to dependent claim 22, the detector structure **22** in the apparatus of Cox includes multiple separate detector elements **14** and the (optical) imaging structure **30** includes multiple lenses, each lens of the multiple elements being associated with a respective one of the detector elements **14**.

With respect to dependent claim 29, the optical imaging system **30** in the apparatus of Cox is constructed on a semiconductor substrate (column 2, lines 60-62).

With respect to dependent claim 30, since the optical imaging system **30** in the apparatus of Cox may be made of silicon (column 2, line 61) and the substrate **44** of the detector structure **22** is made of silicon (column 3, line 6), the two are made of the same material.

With respect to dependent claim 31, at least one of the optical imaging system **30** and the substrate **44** of the detector structure **22** is made at least partially of silicon (column 2, line 61 and column 3, line 6).

With respect to dependent claim 33, the apparatus of Cox further comprises a membrane¹⁶ supporting the detector elements **14**.

Response to Submission(s)

16. The amendment filed May 20, 2001 has been entered.

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Constantine Hannaher whose telephone number is (703) 308-4850. The examiner can normally be reached on Monday-Friday with flexible hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (703) 308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ch
December 16, 2002

Constantine Hannaher